

REPORT OF A CASE OF TRIGEMINAL PARALYSIS.¹

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The successful excision of the Gasserian ganglion by surgical procedure has afforded an exceptionally favorable opportunity for the physiological study of the trigeminus. A perusal of the more recent literature on the subject, however, still discloses many wide differences of opinion among students and investigators regarding the functions of this nerve. It is, therefore, desirable that cases in which the nerve has become paralyzed by the influence of some pathological process, as well as those in which various of its branches have been divided surgically, or the Gasserian ganglion itself removed, should be carefully studied and reported, so that from the mass of evidence thus accumulated conflicting views may be finally harmonized. Cases of trigeminal paralysis have, then, a double interest, clinical and physiological.

After all, it is not an easy matter to draw exact conclusions either from clinical or operative cases, if I may be allowed to make that distinction, for in the former it is often impossible to determine the exact limits of the influence of the pathological process producing the symptoms, and in the latter, on account of the surgical inaccessibility of the ganglion, more or less injury to contiguous structures can hardly be avoided. Then, too, the question being one which relates mainly to the various forms of sensation, the personal equation has very often to be reckoned with, which, of course, properly warrants more or less skepticism of published results.

The wide variation, not to say contradiction, which patients make from time to time in reference to their sensations might tempt the reporter to omit or suppress certain statements in order that his report might sound more reasonable or read better, but this would greatly vitiate its value, because, as already implied, activity of the pathological process, susceptibility of the nervous tissues, mental and emotional states, each and all

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are vital elements or factors in the problem, and normally subject to very considerable fluctuation. A fair understanding of the personal traits of the individual upon whom the tests are made, however, is essential to the most correct estimation of their value, and therefore I shall now state that my patient is a well educated, cultured gentleman, who has always been conspicuously neat in his dress and personal habits, and thus might be expected to give more than ordinary attention to any deviation from the normal in any of his sensations. Indeed, what with the explanations and directions I gave him, and his natural tendencies, he very soon became a deeply interested and intelligent student of his own case, as might be surmised from his own written report of his symptoms, which I shall presently quote.

Mr. A. B., druggist, consulted me January 21, 1896; aged 57; married; lues denied; family history good, and personal habits irreproachable. Has always been an active worker, and enjoyed excellent general health. Had accumulated a handsome fortune by his own efforts, when a few years ago some of his property began to depreciate through causes which he could not foresee or remedy, and this in connection with some domestic trouble, has kept him constantly under a very distressing state of mental tension for some time. He had some irregularity of the heart six years ago, but recovered under the Schott treatment. Five years ago he had a severe attack of sciatica on left side, resulting in peroneal paralysis, with anesthesia of dorsum of foot, for which I treated him with electricity for about four weeks, when he recovered with the exception of some reduction of sensibility on the dorsum of the toes, which has persisted ever since. Otherwise his health has been excellent.

About two weeks ago, when brushing his teeth, he noticed a reduction of sensation in the gums of the upper maxilla of the left side, and a few days later lack of feeling in the upper lip of that side, and finally over the whole side of the face, including the scalp up to the middle line and backward nearly as far as the ears. He has noticed for the past day or two that the cheek was slightly swollen and the eyelids slightly stiff. Has not had a particle of pain. Got an eye-winker in the left eye yesterday and felt it as usual (?); has not noticed any defect in taste, or difficulty of mastication.

Examination. Sensation to pain and touch distinctly reduced throughout distribution of first and second branches of

fifth nerve. The reduction is greatest on cornea, gums, mucous membrane of cheek, and a circular area about the size of a silver fifty cent piece a little below the eye. Elsewhere sensation is normal, except a very slight anesthesia of the dorsal surface of the toes of the left foot, resulting from sciatica five years ago, as stated. Skin and tendon reflexes normal; no ataxia nor swaying with eyes closed; taste on the anterior two-thirds of tongue, left side, seemed reduced for bitter. The muscles of mastication appear to contract equally on the two sides. The pupils are equal and react normally to light and accommodation. Vision was not tested, but patient stated that he had occasion to use the eyes a great deal and had noticed no defect.

Treatment. Grains five iodide of potassium after meals; grain 1-32 strychnia before meals; galvanism 8-10 milliamperes to face ten minutes, three times a week.

January 28. Anesthesia has increased in the region of the second branch, and patient thinks decreased in first.

Smell has been repeatedly tested, and does not appear to be much, if at all, affected, but the septum on the left side appears to be entirely anesthetic. Two days ago patient had symptoms of a general cold, including sneezing, and took ten grains of Dover's powder; next day had pain for several hours, not very intense, in afflicted parts. Yesterday noticed difficulty in mastication on account of weakness of the muscles on left side, and found himself, contrary to his habit, using the other side. General health and spirits excellent; no pain except "soreness" of left side of tongue. A few days ago there was slight edema of left lids; none at present. No lowering of sensibility could be demonstrated in the region supplied by third branch to-day.

February 7. Began to notice that the lower gums on the left side were insensitive and anesthesia more pronounced in other parts. For several days has been taking 3 iii syrup hydriodic acid *t.d.* instead of 10 grains of potassium iodide. He was put back on iodide of potassium; suffers with insomnia, but has no pain. Muscles of mastication on left side still get unduly tired.

February 10. Upper and lower gums quite insensitive, and though there is hyperesthesia to the galvanic current over the left side of the face, sensation to touch and pin-pricks is distinctly lowered. The cornea can be touched firmly with the end of a pen stalk without producing any pain or reflex whatever.

February 12. Patient distinctly better for the past two days; less anesthesia of all parts except the upper lip and gums.

February 14. A spot about the size of a half dollar in the

center of the cheek below the eye is very hyperesthetic to the galvanic current and to pin-pricks, but when pressed with the finger feels as if there was a thickness of cloth—about medium weight broadcloth—between the finger and the cheek. The left side of the tongue is now hypersensitive to touch and taste in its anterior two-thirds. The gums react to the galvanic current and to pin-pricks and touch about the same on the two sides, but the cornea is quite insensitive to touch.

February 24. For the past three days patient has complained of marked numbness of the whole area of the fifth. While he feels a touch and prick in most places, it does not feel natural; feels as it might through a thin glove. He states that the muscles of mastication are growing distinctly stronger; do not tire as before. Corneal reflex still absent and cornea insensitive.

February 28. Patient has suffered for one week with dimness of vision, but when the eyes were tested separately with usual glasses vision was found to be 20/30 in each eye. Last evening, however, he developed marked diplopia, which appears to be due to weakness of the left external rectus. His subjective sensory symptoms are much less than two days ago. Referred to Dr. Henry Gradle for visual complications. (See Dr. Gradle's report below.)

March 6th. One week ago iodide of potassium was increased to gr. 20, *t.d.* For last three days face has felt almost normal, but diplopia constantly marked.

March 9th. Paresthesia somewhat worse in second branch, especially on cheek. Diplopia rather more marked. With my consent patient discontinued all medication and took a trip to California.

I met the patient casually several times between the period of his return from California a few months subsequent to the last entry and February of last year (1898). He assured me that there had been no material change in his symptoms, excepting that his diplopia had been much improved by an operation performed by Dr. Gradle; that his financial reverses had grown steadily worse, and he had exerted himself to the utmost to arrest them; yet his general health and capacity for work were excellent. At my request he readily agreed to take careful note of his symptoms covering a period of several months and write out the result for me. He gave me the following report about three months ago:

"I have been watching the conditions carefully, but have refrained from making any notes on account of the surprising changes constantly taking place. The variations are slight. Frequently of the numbness there is very little for a time, then

it is more apparent. These changes are of frequent occurrence, but on the whole the anesthesia is gradually lessening, it seems to me, possibly because I am becoming accustomed to the condition. In certain parts of "b" [Fig. 1] the sensations are often peculiar. I have felt a trickling as of cold water down that locality, but on putting my hand there I have always found the part perfectly dry and not even chilly. Again, a flash of heat will be the sensation when the fingers tell me there is no elevation of temperature; a sensation as of soreness

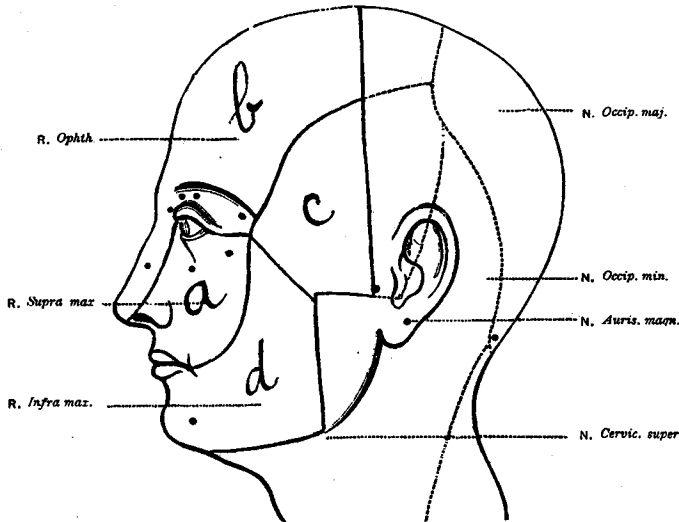


Fig. 1. At a, especially in central part and over cornea, the anesthesia is greater and more constant than elsewhere, excepting the external surface of upper gums and the contiguous mucous membrane of the cheek.

occurs, yet the part is not sore to the touch. At "c" [Fig. 1] the numbness seems to remain about constant, gives me no annoyance whatever; at "d" [Fig. 1] the anesthesia is at times very slight and never intense. The upper and lower lips on left side vary intensely from nearly normal to absolute anesthesia. Mastication is entirely on the right side, because I am liable to bite the left cheek and lips if performed on the left side. An almost invariable sensation of stiffness and swelling results at times of or after eating, and this seems particularly aggravated if salt and pepper, or either, comes in contact with the parts. Yet I find no difficulty in using the muscles and moving the parts, nor is there any distention that I can discover. This sensation does not last long at any time, yet is

very unpleasant. A sharp, stinging sensation occasionally darts through the left eyeball. It is not absolutely painful, feeling as though a fine cambric needle had been sent through it with the rapidity of lightning, and the sensation is gone. The teeth and upper and lower jaws on the left side are absolutely without sensation, except at times when a shock as of an electric current passes, and I can repeat this by bringing the teeth in contact. This sensation is occasional, not constant. An itching sensation akin to pain is not infrequent in the left eyebrow; it is not painful, and rubbing for a minute or two with the thumb dissipates it for the time. The left eyeball is absolutely without sensation at any time, except as before stated. Health perfect; digestion good; able to do any amount of mental or physical work; eat fairly well, but am never hungry. Sense of taste on left side of tongue varies; sugar is most readily detected, because most readily soluble; salt next; strychnia next; flavors are detected, but less readily than on the other side. I find it impossible to sleep more than two to four hours unless I take 10 grains of sulphonal on retiring, when I can readily sleep five to six hours. When not particularly troubled or anxious sulphonal is omitted three or four nights in succession, and sleep is natural during that time for from four to six hours. After lunch each day I sleep readily for twenty minutes, but omit this without inconvenience if I am occupied or have appointments to keep. All heart disturbance has disappeared. Vision is good in both eyes, but left eye does not focus with right, and there is a blurring sensation in consequence. Roof of mouth on left side is without much sensation, either to touch or taste. Left side of nose inside at times nearly normal; at others almost insensible to touch. Exposure to cold air causes a sensation of pain and stiffness on left side of face, which is very uncomfortable; yet there is no pain or stiffness when the parts are pressed or manipulated. Left side of tongue has a nearly continuous sense akin to soreness, the cause of which I am unable to determine. It may result from contact with the teeth or with food, or both; the numbness preventing the cause of the irritation being noticed at the time of its occurrence. Occasionally particles of food are swallowed which have not been sufficiently masticated, the effort to swallow giving the only intimation of the fact.

"The foregoing is a very brief summary. Much more could be noted had I the opportunity to describe the peculiar sensations at the time of occurrence, and some of the sensations would be difficult to describe under any circumstances."

February 10th. Patient re-examined to-day. There is marked ptosis of left side, but the ocular condition will be much

better described by Dr. Gradle than I could describe it. Extensive, if not complete atrophy of the temporal muscle is evident on inspection, and the same would probably be true of the masseter were it not obscured by the beard. When the patient bites only a feeble contraction can be felt. The lower jaw cannot be moved horizontally to the right beyond the upper, showing that the action of the left external pterygoid is deficient. The palatal arches are equal in repose, in movement, and sensation. Taste, touch, and the pain sense are normal on the posterior third of the tongue. Other conditions, exclusive of those described in Dr. Gradle's report, remain the same as three years ago.

Calling to mind the anatomy of the parts, it may readily be understood how a superficial neoplasm or aneurism at the side of the pons, developing quite rapidly at first and afterwards very slowly, might account for the symptoms. Tabetic changes affecting the nuclei of the several nerves, or the fibers emanating therefrom, might suggest themselves. A deep neoplasm involving the nuclei and fibers may, I think, for obvious reasons be excluded, and so also at this time may a superficial neoplasm of malignant type. Neither is it hardly conceivable that a syphiloma should enlarge so rapidly at first and afterwards so slowly, and that there should have appeared no other evidence of lues in the meantime. An aneurism might enlarge quite rapidly at first and then very slowly, corresponding to the successive invasion of contiguous nerve trunks. The age of the patient, too, is favorable to aneurism. Its presence, however, might be expected to injure to some extent the dura and adjacent bone on the one hand, and the superficial transverse fibers of the pons on the other; thus, giving rise to pain, and also symptoms of pressure upon the pyramidal fibers passing through the pons, both of which were absent.

The sensory symptoms of tabes, even when the disease commences in the brain stem, are usually bilateral nearly from the first, and almost never remain so strictly unilateral and so limited for so long a time as they have been observed to do in this case. Neither do they develop so rapidly at first and then slowly and gradually, involving consecutively nerves of which the trunks are contiguous, but the nuclei far apart and separated by other structures, the invasion of which must cause symptoms here absent.

Transient and recurrent diplopia is a common symptom of tabes in the earlier stages; but the same cannot be said of diplopia depending upon atrophy of ocular muscles; for assuming that a single lesion is producing the symptoms in this case, then, inasmuch as it has demonstrably caused destructive changes in the neurons composing the motor root of the fifth, it is not unfair to infer that the fourth, sixth and third have suffered in the same way. Again, it is highly improbable that early tabetic changes should show such a preference for motor structures as is here manifest; that is to say, having invaded four motor nerves and only one sensory nerve. Neither can the visual symptoms be regarded as affording any particular support to the diagnosis of tabes.

If one of the degenerative changes of the nervous system must be held responsible for the symptoms, then that pathological process which, when it attacks the peripheral motor neuron forms the basis of the clinical condition commonly designated progressive muscular atrophy of the spinal form, may be brought into requisition with far less distortion of its ordinary features than must be resorted to if tabes is employed for that purpose. Indeed, that form of progressive muscular atrophy known as bulbar paralysis occurs most commonly in people of about sixty, and though nearly always so is not invariably bilateral. I reported a case at the Mississippi Valley Medical Association, held in Louisville, September, 1897, in which the disease first appeared in the nucleus of the third nerve on one side, and in about eight months had nearly destroyed it, whereupon it appeared on the opposite side and advanced to complete destruction of both nuclei in about two years from its commencement. Soon after this it made its appearance in the cervical enlargement, as shown by atrophy of the thenar muscles of one hand, and a few months later those of the other, both hands becoming powerless less than two years later.

Finally, I repeat that, while not unmindful of the aberrant tendencies of so-called degenerative processes occurring in nervous structures, and those of tabes in particular, aneurism appears to me the most probable diagnosis.

If the disturbance of taste in the anterior two-thirds of the

tongue is greater than can be accounted for by the mere alteration of the tactile and pain senses then, of course, the case supports the contention of those who maintain that gustatory fibers from this part of the organ of taste pass to the brain through the trigeminus; but even so, no indication is afforded as to whether the course is through the otic or through the sphenopalatine ganglion. On the other hand, if the proper sense of taste is not lowered, then confirmation is afforded to the doctrine of those who contend that the pathway in question between the geniculate ganglion and the brain is via the nerve of Jacobson to the petrous ganglion.

REPORT OF OCULAR CONDITION.

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The patient, through the courtesy of Dr. Sanger Brown, came to me on the 2d of March, 1896. As I had known him for some years, I can fully corroborate what Dr. Brown has said regarding his education, superior attainments, and ability as an independent observer. He came to me on account of diplopia due to paresis of the left external rectus. Abduction was not much diminished, but there was slight convergent strabismus on looking straight forward. Paralysis of the abducens or external rectus does not by itself give rise to strabismus when the eyes are directed straight ahead, except in individuals whose muscles are not evenly balanced, and in whom the internus had the excess of power before the paresis occurred. When I first saw him there was convergent strabismus of six degrees, measured by the prism when looking directly forward.

He gave a history of severe coryza early in January, about two months previously, which persisted on the left side more than on the right. At the time he called there was no longer any acute inflammatory condition in the nose, but there was a purulent secretion, rather scant, from the left side. The septum was deflected to the left. The secretion came from the posterior regions, and may have been due to the inflammation of the sphenoid sinus. Some treatment by irrigation was adopted, which diminished this secretion and it almost disappeared. I